Financial Technology and digital innovation to modeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies

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REPORT ON THE LABOUR MARKET NEEDS OF THE FINANCIAL SERVICES INDUSTRY IN VIETNAM AND THE PHILIPPINES

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1. ABSTRACT

TRUST "Financial Technology and digital innovation to modeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies" is an European Project co-funded by the European Commission in the framework of the Erasmus+ Programme (KA2, Capacity Building). It aims to design and develop a master on FINancial TECHnology and digital innovation (FINTECH), as well as to modernise the MBA and/or other masters of Business and Economics with specific contents on FINancial TECHnology in Vietnamese and Philippines Universities. The project partnership consists in three European universities (IT, RS, UK) and one FinTech company (IT), three Vietnamese and three Philippines universities, and one FinTech organization from the Philippines.

With reference to the project action, Philippines and Vietnamese partners carried on a very interesting study according to the scopes of Work Package 1 'Mapping the current capacities of the HEIs and of the labour market needs of the Financial Services Industry in Vietnam & Philippines' scopes. A scoping study allowed to map evidences of existing Higher Education (HE) programmes on FinTech in Vietnam and Philippines and to underline the presence of the necessaries basis for the educational programs future implementation. This research study was aimed at assessing the professors and the universities' staff training needs on FinTech and digital innovation, as well as the FinTech market labour needs in both Asian countries. The scoping study method included the following steps: identifying relevant studies; study selection; charting the data; processing, summarizing, and reporting results.

Moreover, a field work research method allowed to collect both qualitative and quantitative data (questionnaire) on the current capacities of universities in FinTech and on Higher Education actors' perception on the development of new programmes or the updating of the traditional ones on that topic (to understand professors/HEIs managers/staff in their everyday work experience). The investigation (in-depth interview) a on the Financial Services Industry in Vietnam and Philippines aimed to mapped the necessaries skills and knowledge of the labour market through qualitative interviews (based on an in-depth qualitative analysis using a critical incident interview methodology) in each partner country with representatives of the Financial Industry Services start-ups.

2. THE TRUST PROJECT

The TRUST Project represents a curriculum development initiative that is geared towards developing a new Master's degree programme in information technology (IT) related finance alongside the refinements of existing Master in Business Administration (MBA). It aims to improve the quality of the higher education in Vietnam and Philippines in financial technology and digital innovation to answer to the emergent workforce need of the financial services industry.

The specific objectives are to: (1) design and develop a master academic program in financial technology and digital innovation in Vietnam and Philippines; (2) modernize relevant existing masters academic program in business and economics with specific contents on financial technology. This academic program was envisioned to prepare students in the financial services that require complicated use of technology. It targets to have graduates who would be active in participating to online banking platforms, investments and business. In addition, the master program would produce graduates who are encourage to create business start-ups using technological innovations that allow them to reach through broader market, and can cope with the rapid development of financial technology. Furthermore, the master/s program shall enable graduates to remain competitive in the information technology career and in the business.

Hence, a consortium was formed in January 2020 involving three European Higher Educational Institutions (Guglielmo Marconi University, IT; Glasgow Caledonian University, UK and University of Belgrade, RS), one European FinTech enterprise (Deus Technology, IT), three universities from Vietnam (University of Economics and Business of Vietnam National University, Hue College of Economics, Ho Chi Minh City Open University), three universities and one FinTech organization from the Philippines (Mapua University, Saint Louis University, and University of Cebu, Fintech Philippines Association). This consortium was created with project number 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP titled "Financial Technology and Digital Innovation to ModeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies (TRUST) co-funded by the European programme Erasmus Plus (Call for Proposals 2019 – EAC/AO3/2018), Key Action 2 – Cooperation for Innovation and the Exchange of Good Practices – Capacity Building in the Field of Higher Education (CBHE). This initiative is expected to develop a new master program consist of innovative pedagogy and hands-on experience to better prepare graduates in a fast evolving industry that requires competence in finance, business management equipped with tools of new technology for faster service with accuracy, and apply a new mode of thinking.

The main target output of TRUST project in the Philippines and Vietnam is the offering of Master in Financial Technology (FinTech) and Digital Innovation started in the universities

partner by 2022. The curriculum of master is expected to be delivered in blended modality to include both workshops and distance learning to at least 120 students each country. Apart from the target new master program in FinTech, it is also expected that the higher education partners will improve its existing relevant or related academic programs by updating its modules and include both workshops and online learning in its contents.

The TRUST project is composed of seven (7) work packages; however, this report focuses on Work Package 1 (WP1). The WP1 aims to map the current capacities of the HEIs, and the labour market needs of the financial services industry in the Philippines and Vietnam. This WP includes a scoping study and a field work research carried out to contribute vital information for institutional planning for the development of the master program. The result of the research will help the universities to figure out on what courses shall be included, tools to be used, and modality of delivery to produce academic program that has the capability and competency in providing human resources who are technologically competent to support financial services industry.

3. THE LABOUR MARKET NEEDS OF THE FINANCIAL SERVICES INDUSTRY IN THE PHILIPPINES

3.1. The Philippines FinTech at a Glance

The Republic of the Philippines (Figure 1) composed of 7,641 islands, the 2,000 of which are inhabited, are called home to about 110 Million Filipinos[1]. Due to the geographical nature of the country and the current COVID-19 pandemic situation, people are striving, and trying to cope with the shift of socio-economic and technological demands, and keep abreast with the neighboring countries in terms of financial technology trends. In this fast changing world, knowledge in FinTech and digital innovation becomes a necessity.

Figure 1. The Republic of the Philippines composed of three major groups (Luzon-Northern Philippines, Visayas-Central Philippines and Mindanao-Southern Philippines)

FinTech describes new technology with the objective of enhancing, securing, and automating the delivery of financial services. The FinTech industry is a fast growing market outgrowing the current market talents. Financial education is a paramount challenge in the Philippines. Based on the rating of Standard and Poor's (S&P), there were only 25% of

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[1] Worldometer, (2020). Philippines Population in 2020. Available at
https://www.worldometers.info/world-population/philippines-population/ on October 31, 2020

Filipinos who were financially literate and less than 1% who has knowledge in investing. This situation posed threats to the living standards of Filipino families. Based on the initial information of FinTech Philippines Association, the FinTech industry needs are as follows: improved digital infrastructure, finding the right technology talent, and improved foundational education in mathematics/engineering. Hence, according to the Commission on Higher Education (CHED), collaboration between industries and higher education stakeholders will strengthen an education sandbox infrastructure, a working directory or a test server.

A Master in Financial Technology will strengthen the financial competency/literacy among Filipinos. With the integration of digital innovation such as business analytics in the program would facilitate a more efficient way in solving analytical problems in the financial sector. Higher Education Institutions would be better prepared to produce Talents who could provide the required services of FinTech industry.

The Philippines through its "Build, Build, Build" program has increased infrastructure spending forcing to surge foreign investment in digital transformation. The Bangko Sentral ng Pilipinas (BSP – the Central Bank of the Philippines) pursues three (3) strategic thrusts to harness digital technology for greater financial inclusion in the country[2]. These three strategies are (a) building an inclusive digital finance ecosystem, (b) creating compelling use of cases for financial inclusion, and (c) fostering financial literacy and trust in the financial system through consumer protection. Among the 110 million Filipinos as potential FinTech user, 47% were coming from urban areas, 29% share of adults with a bank account, 12 finance access points per 10,000 adults, 2.0 ATMs per 10,000 adult, 67% internet penetration, 65% smartphone penetration, 150% mobile subscription, 54% internet users using mobile banking, 1.2 branches per 10,000 adults, 2% credit card ownership, 335 share of adults with outstanding loans, and 9% share of MSME (micro, small and medium enterprises) loan to total business loan[3]. In addition and in the Global FinTech Index, Manila was ranked 66 out of 238 cities, and Philippines ranked 46 out of 65 countries[4]. This scenario illustrates a big FinTech market potential in the Philippines. Further, the Philippines is a regional hotspot for FinTech in payments, alternative lending, digital banking, and supporting enterprises. There are over 100 FinTech companies in Manila ranging from payment start-ups, blockchain players and established banks launching their own neobank platforms. Currently, there are about 197 FinTech companies in the Philippines with 14

[2] Konig, C., (2020). *The Philippines FinTech Report 2020*. FinTech News Network, FinTech Alliance. PH.

[3] Philippine Statistics Authority, (2020). We are Social 2020 Digital Report, Global Findex World Bank, Bangko Sentral ng Pilipinas.

[4] The Global FinTech Index (2019): The Global FinTech Index City Ranking Report, Findexable Limited (www.findexable.com), December 2019.

categories such as Lending (24%), Payments (21%), Wallets (12%), Remittance (12%), Blockchain/ Crypto (8%), Crowdfunding (4%), Comparison (4%), Neobanks (3%), E-commerce (3%), Credit Scoring (3%), Marketplace/Investment (3%), Insurtech (2%), KYC/Security/ RegTech (2%), and AI/Big Data (0.5%)[5]. According to the Founder of FinTech News Network, Christian König, that Manila was named in 2019 as one of the friendliest cities in the world for FinTech startups. Hence, the industry is expected to increase by 84% in 2022 from its 2018 record. This is further forecasted to increase beyond double from its 2018 record due to the COVID-19 pandemic by which people were forced to use digital platforms during lockdown.

The Asia-Pacific FinTech market is expected to have an average annual growth rate of 72.5% for the period of 2019-2025 just before the declaration of pandemic. The market segmentations by service are: payments, personal finance, loans, insurance, fund transfer, wealth management, and among others. The segmentations by application are: banking, insurance, trading, taxation, and related others. Figure 2 (below) shows the growing FinTech industry in the Philippines especially in the areas of mobile banking, credit cards and ATMs (automated teller machines), internet and smartphone penetration which are few of the Launchpad in which consumer-based FinTech can grow.

Figure 2. The growing FinTech industry in the Philippines

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[5] McCathy Earls E., (2019). Preparing Students for a Future in FinTech: The Role of Massachusetts Public Universities. Pioneer Institute, Public Policy Research, White Paper No. 194, march 2019.

Another promising area in FinTech is business loan to MSME as mentioned above. Loan out to this sector is a tiny fraction compared to the overall loan part of the reasons is the financial system formalities in terms of access to finance which financial technology can offer a good alternative in terms of lending practices. In terms of payment transactions by value ATM remains as the main payment platform with 72%, another big potential for FinTech considering that eventually portion of this market will detach itself from this traditional payment platforms available, ATMs included. Another few avenues that have big potential include Insurtech, Blockchain and Cryptocurrencies which will eventually gain the confidence and acceptance by the mainstream market in few years. Hence, the Philippines is expected to keep abreast with its neighboring countries in terms of FinTech and digital innovation.

3.2. Overview of the Higher Educational Institutions in the Philippines

The Philippines with about 110 Million people, has 541 state universities and colleges (SUCs), 132 local colleges and other government schools (LCUs), and 1,721 private higher educational institutions (PHEIs) as of August 08, 2019 [6]. A total of 2,392 HEIs in the Philippines including SUCs satellite campuses. Seventy two percent (72%) of the total HEIs in the Philippines are private institutions. These Philippine Higher Education Institutions are composed of stock and non-stock capital type of institution. Figure 3 clearly describes the Philippines Higher Education Institutions scenario that is dominated by privately owned Higher Education Institutions.
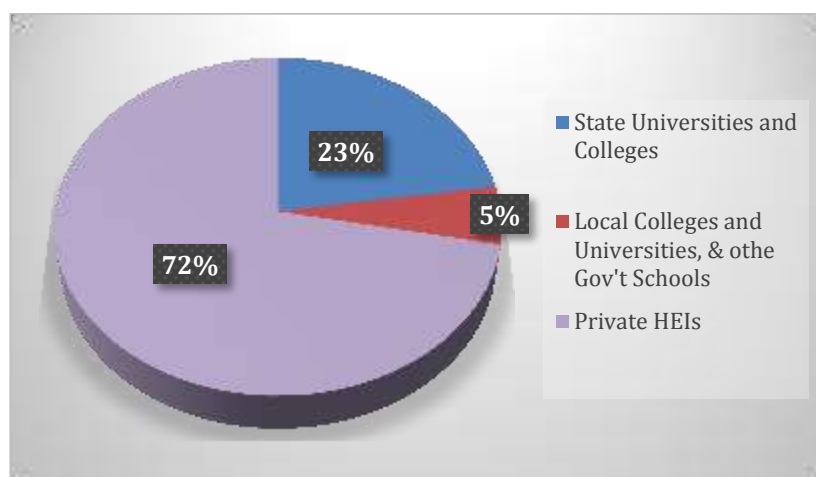

Figure 3. Types and distribution of HEIs (including SUCs Satellite Campuses) in the Philippines

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[6] Commission on Higher Education, 2019. Distribution of Higher Educational Institutions by Institution Type: AY 2018-2019. Available at https://ched.gov.ph/distribution-of-higher-education-institutions-by-institution-type-ay-2018-19/ on October 25, 2020.

Currently in the Philippines HEIs are abiding by the latest Memorandum Orders issued in 2017 by the country's regulatory agency, the Commission on Higher Education (CHED). One of the specializations being recognized in these CHED orders is Business Administration major in Financial Management the only specialization related to finance and banking outside specializations in Accountancy education. Engineering and Tech as well as Information Technology education are covered by another memorandum orders with listed courses that are understandably focused on core competencies in their respective disciplines. At present, there is no specific memorandum order to offer financial technology program for HEIs in the Philippines

In academic year 2019-2020, higher education enrollees in the Philippines totaled 3,408,425 of that figure 48.79% are in Business, IT, Engineering and Tech (Figure 4). Specifically, 878,661 (25.77%) are enrolled in Business Administration and related fields, 324,696 (10.05 %) are enrolled in IT-related disciplines, while Engineering and Tech has 442,064 (12.97%). With the current shortage of high-value skills in the areas of Engineering, Information Technology, Business and other related field, there are two apparent things that need to be addressed. First is the need on the part of the academe to re-orient and create a cross point offering where traditional business, IT, engineering and tech courses can max out its their common potentials. Another thing worth noting is the fact that this current scenario of talent shortage beams on the presence of a promising market gap that this hybrid course offering in FinTech can fill in both from the academic as well as in the industry standpoint.
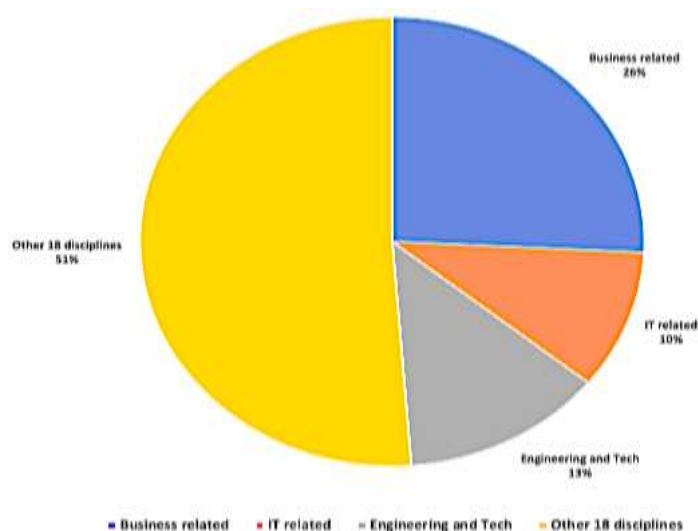

Figure 4. Enrollees by discipline during the academic calendar 2019-2020[7]

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[7] Commission on Higher Education, 2019. Distribution of Higher Educational Institutions by Institution Type: AY 2018-2019. Available at https://ched.gov.ph/distribution-of-higher-education-institutions-by-institution-type-ay-2018-19/ on October 25, 2020.

The Philippines, through the Republic Act 10533 – Enhanced Education Act of 2013, has implemented its K-12 basic education program. This program accelerates mutual recognition of Filipino graduates and professionals in other countries. This provides every Filipino the education he/she needs to compete in the global community. Hence, the CHED aims at giving Filipino students the skills, concepts and deep knowledge to compete in the global arena.

One of the most recent and noticeable developments in business transactions is the acceptance and confidence by consumer in online and mobile banking, electronic paymets, money transfers and electronic settlements. The good technological indications are the exploration of institutions and startups on other areas such as Blockchain technology, artificial intelligence, cryptocurrencies and other advanced technologies in the financial services sector. These movements in the financial sector demand a new generation of workforce with new set of skills. Hence, HEIs shall act fast to produce human capital and support the labour needs of the rapid growth of FinTech industry. FinTech education could be a good precursor to a more technologically laden business atmosphere that liberates market participants from going through the rigorous formal financial market system. At the grassroots level, FinTech, in substance, promotes inclusiveness considering the fact that 99% of all businesses in the Philippines are composed of MSMEs. Many of these businesses are into the formal financial sector however 71% (51.2 million) of Filipino adults do not have bank accounts. This 51.2 million are consumers who would easily prefer convenience over financial formalities in their daily transactions. Advancement and access to financial technology by this market speeds up transactions, increases business volume and output averages which in turn improve business conditions and will eventually redound to the benefit of the overall economy.

3.3. Research Methodology

The project WP1 includes a scoping study conducted in the Philippines aimed to assess professors and the universities' staff training needs on FinTech and digital innovation. This was carried out by Mapua University (Manila), Saint Louis University (Baguio), University of Cebu (Cebu), and the FinTech Association of the Philippines - FAP. The study utilized the descriptive, and qualitative research design. The descriptive method describes the characteristics of the population being studied. This methodology focuses more on the 'what' of the research subject than the 'why'. It describes the nature of a demographic segment, without focusing on 'why' a particular phenomenon occurs.

Moreover, a qualitative research involves collecting and analyzing non-numerical data to understand concepts, opinions, or experiences. It was used to gather in-depth insights into a problem or generate new ideas for research. Two types of survey instruments were utilized in this research. One focused on the mapping of Philippine HEIs in terms its capability to

deliver the courses, the choices of the respondents on the kind of teaching modality at their convenience. This is due to most master students are working. The other survey instrument involved the FinTech Association of the Philippines (FAP). Hence, two sectors were involved in the study (Education and Financial industry) as shown in Figure 5, that illustrates the conceptual framework of the study. The research instruments that were employed for this research contained both close and open ended questions. The universities survey target respondents were the senior university managers and faculty members. The other set of questions yielded quantitative data were tested and analyzed using frequency counts, percentages and one of the measures of central tendency which is median. Frequency is simply counting the number of observed values. Percentage, on the other hand, is a descriptive analysis demonstrating the comparison between sizes of the population and sample in a particular area. While median is the value which occupies the middle position when all the observations are arranged in an ascending/descending order. Median was used to treat the data since it is not affected by outliers; hence, giving more meaning to the described data. Data gathering was done during May to September 2020.
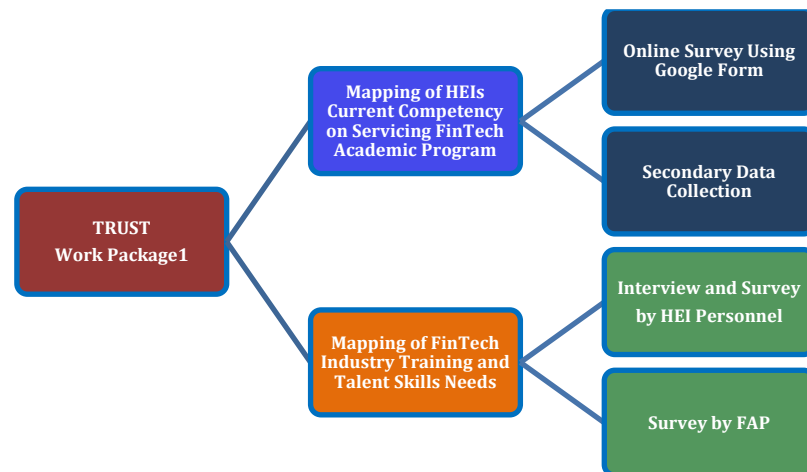
Figure 5. Conceptual framework for the mapping of HEI current competency and the FinTech industry training needs

As mentioned above, scope of the study covers the whole country with a minimum target of 50 respondents from Higher Education Institutions, and 10 interviews from FinTech industry. This is to address the minimum sample size requirement of 99% confidence level for data assessment. The scoping study included the following steps: (a) identifying relevant studies; (b) study selection; (c) data collection; (d) data curation (i.e., data tabulation, summarizing), (e) creation of figures; (f) interpretation, and (g) analysis. Some modalities were applied to gather the data.

3.4. Data collection

The industry data collection was administered to FinTech and related companies operating in the Philippines. This was to determine the current and future manpower needs to support their current operation and future needs. Structured questions and questions guide were developed by all partners. The survey was conducted using the following mode: interview with permitted recording, and through email using an instrument with structures questions guide. The interview questions guide covered the following: (a) company background, (b) personnel skills at entry level; (c) personnel current competency, the challenges, and training needs, (d) technological tools and services currently used by the company, and (e) skills of talents necessary to support the near future needs of the FinTech industry. The interview guide included open-ended questions about the company background, personnel competencies and challenges, and the technological tools and services. Some enumerators conducted a one-on-one interview, then transcribed the answers on the instrument, and later asked the respondents to read through the transcription and confirm whether the inputs were properly captured. Respondents were assured that their remarks would be reported accurately, but not attributed specifically in the publication without specific permission.

The FinTech Association of the Philippines (FAP) conducted an internal survey and was able to collect data in the first quarter of 2020. These data were considered secondary data for this TRUST Work Package 1. In addition to these data, the FAP conducted reviews from related studies, i.e., within this year and immediate past couple years. Data from this mode of assessment were also considered secondary data.

3.5. Participating Companies and Profile

Based on record, twenty four (24) FinTech and related companies, shown as Figure 6 operating in the Philippines, responded to the interviews and survey. The highest respondents came from the insurance sector with 10 respondents (42%), followed by the software industry with 3 respondents (13%) and then 2 respondents (8%) each from the bank and manufacturing industries. The rest of the respondents came from analytics, ERP, leasing & financing, media, real-estate, regulatory and telecommunication. The respondents of the survey were employees of the company whose designation is in the middle to top level management. The survey was administered to companies with different number of employees (Figure 7). The questions yielded quantitative as well as qualitative data that were analyzed using frequency ranking counts, tabulated percentages and descriptive analysis of responses.

Seven companies (29%) have less than 100 employees, 4 companies (17%) with employees between 101 to 500, 1 company (4%) with 501-1000 employees and 1 company (4%) with 1001-2000 employees. Other companies that responded to the survey have employees

ranging from 2001 to more than 10,000, which are mostly from the insurance industry. The first question asked was on the growth trend of their company in the next 3 years. Nineteen (19) or 79% responded that they expect their company to have a continuous growth in the next 3 years. FinTech companies expected a 100% growth per year for the next 3 years. On the other hand, 4 or 17% responded otherwise while 4% company was not sure on what will be the growth trend of their company in the next 3 years. Another, the companies were asked if they have a dedicated research, development and innovation (RDI) office. Out of the 24 respondents, 13 (54%) responded that they have a dedicated RDI office, 7 (29%) responded that they don't have, and 4 (17%) had no idea on the existence of RDI office in their company. When respondents were asked on how much of the budget was allocated to RDI office, only 5 respondents were able to provide the percentage budget allocation to RDI office. This budget range from 5% to as high as 40% of their income. Eight respondents (33%) answered that they do not have budget for RDI while 11 companies (46%) have no idea on percentage share of their budget to RDI office. These data were associated to the research system in the Philippines that is not matured yet. The majority of the personnel has Bachelor degree with few personnel with master degree. Figure 8 shows the current profile of the respondents of FinTech related industry personnel.
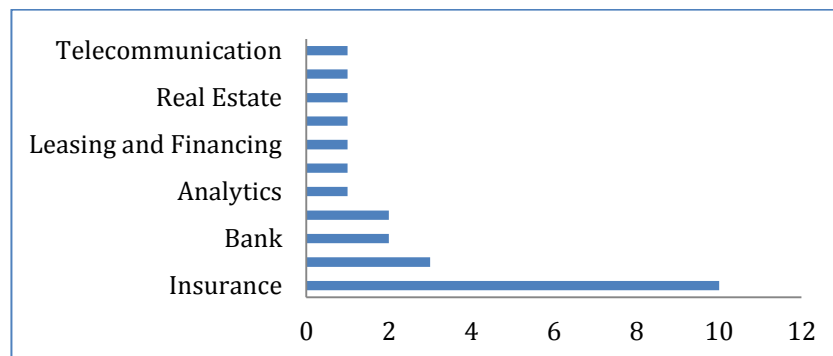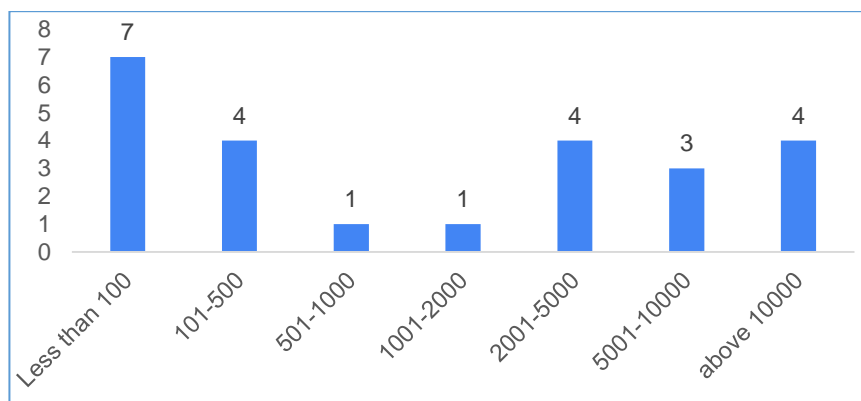

Figure 6. Types of FinTech related industry respondents

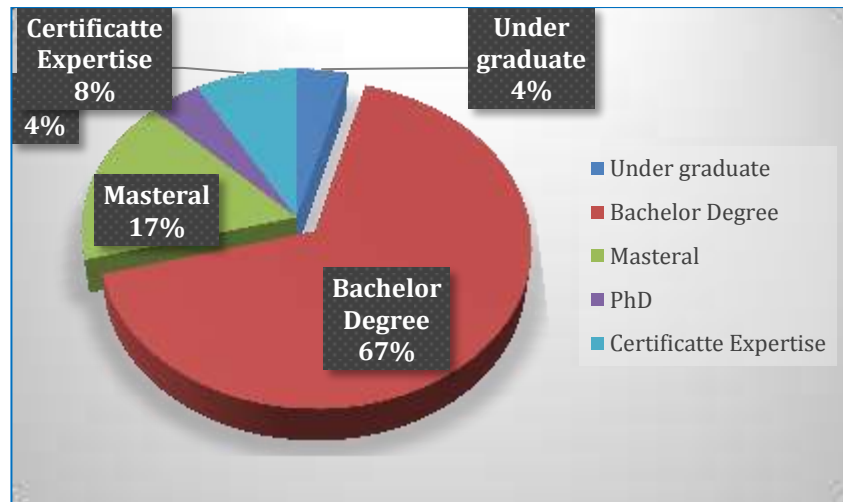Figure 7. The industry respondents and their number of employees

Figure 8. Personnel Profile of Respondents from the Philippines

3.6. Results and FinTech Industry Labour Needs in the Philippines

Subsequent sections below elaborate the results of the mapping study carried out in the Philippines by Philippine TRUST four partners in the Philippines. First subsection discusses the mapping of the labour skills and training needs from the FinTech industry followed the current competency and related academic program offerings of the HEIs in the Philippines. Results yielded both qualitative and quantitative data and information.

On the industry perception about the planned Master in Fintech, in which the target is to provide talents to industry who possess skills needed by the industry, information about entry level skills requirements are important. Hence, the industry was asked on the requirements for the entry level skills of potential personnel. Result showed that the communication skill emerged as the top skills (38%), followed by business/financial skills (24%). Other entry level skills are analytical, problem solving and selling skills which obtained similar percentage of 10%. Design thinking and information technology skills are the least priority skills with only 5% share. This result is associated to the majority type of respondents who were from insurance sector. The interview results to people who are affiliated to payment infrastructure company mentioned that they need people with (a) business and operations, and (b) product and engineering background or skills. Interview results to people whose company is a small to medium size addressing capital needs through crowdfunding mentioned that they need people who are adaptable to technology with financial background. That, the technical background they refer are management engineering, management information systems, and courses in the in the areas of programming languages, database, infrastructure, server maintenance, mobile App development, UI (user interface) and UX (user experience) design. In addition, it was recorded that majority of the personnel has Bachelor degree with few personnel with

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master degree. Figure 8 shows the current profile of the respondents of FinTech related industry personnel.

Based on the surveys and interviews, the current pandemic emerged as the top challenge of the FinTech industry. Forty two percent (42%) or ten (10) companies responded that COVID-19 pandemic is the leading challenge in their operations. However, another FinTech company that focuses on crowdfunding sees the pandemic as an opportunity as there are lots of SMEs that needs financing, and people are going and/or forced to go into digital and online transactions. Another FinTech company said that sensitivity to specific culture is another challenge. However, it is something small companies (like most FinTech companies are) need to embrace and use it as a strength or "selling point". Next to 'pandemic" as leading challenge to FinTech companies is the 'uncertainty in the market'. Twenty nine percent (29%) voted that uncertainty in the market is another challenge. Other challenges identified were digital readiness (4 companies; 17%) and lack of innovation (3 companies; 13%).

The technology tools used by, and number of FinTech and related companies were: (a) computer as the main technology hardware tool by 38% companies, (b) artificial intelligence (AI) and other similar technologies by 17% or 4 companies, (c) information and communication technologies (ICT) by 17% or 4 companies, (d) ERP by 13% or 3 companies, (e) POS (point of sale) by 8% or 2 companies, and (f) own banking/insurance system by 8% or 2 companies. Sixty seven percent (67%) of these companies have internal software development team and twenty five percent (25%) said that they don't have. Whereas, eight percent (8) said the they don't have idea if their company has internal development team. This last answer indicates either the respondent is a "newbee", a lower ranking personnel, simply don't want to answer the question, or indicates the incompetency of the personnel. The typical software used by the responding companies are Java (GoLink), C++, SAP (Systems, and Applications and Products).

An overwhelming majority (87.5%) expressed interest to enroll in a FinTech related master program. However, FinTech companies mentioned that they prefer experiences than degree. This is because the evolvement of new technology is always faster that the people acquiring the relevant degree, and the trend is "adaptation to technology". Therefore, a master program that is equipped with academic courses, and blended with hands-on experiences on software used in FinTech companies, and emersion in FinTech or related companies would produce graduates/talents who can support the manpower needs of the FinTech industry. International immersion would expose students to various socio-economic cultures which would be helpful to talents before they enter into the, submit themselves to work for, and contribute to the success of FinTech industry.

3.7. Data Assessment by FinTech Association of the Philippines

In the internal survey among 175 members of the FinTech Association of the Philippines (FAP) and some guests conducted in May 2020, it was found out that the current competencies of their personnel are traditional functional roles such as sales, marketing, finance, human resource and among related others. The membership breakdown of this FAP members is shown as Figure 9 showing diverse sector groups in the FinTech industry. These results of the internal survey translate to competencies defined for decades by the human resources team based on experience and skills patterned after traditional industries such as banking and insurance.

The result of the internal survey, plus the current pandemic situation, points to the direction of talents' skills that are shifting from traditional functional roles to technology-oriented solutions and business models in light of the post-pandemic economy. This means that FinTech industry is in need of talents/manpower who have the following six (6) skills:

1. digital sales and marketing,
2. basic computer or software troubleshooting,
3. use of online tools and teleconferencing,
4. data analysis and insight,
5. managing cloud-based operations through Software-as-a-Service (SaaS),
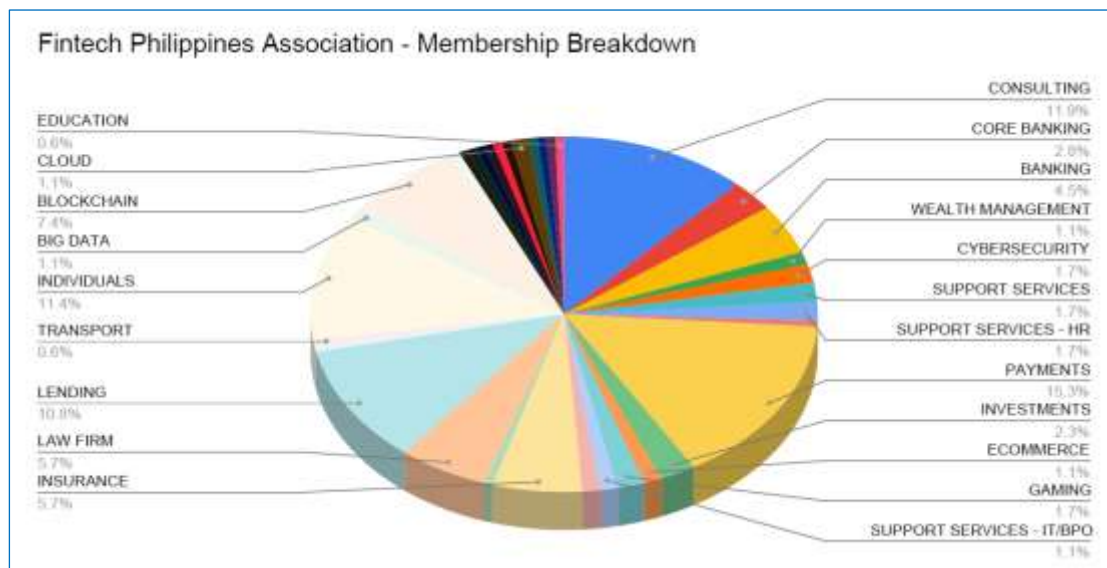6. utilizing logistics and e-commerce platforms.

Figure 9. The FinTech Philippines Association Members

Based on the current manpower competencies and the industry needs, the following trainings, listed below, are considered critical. The set skills necessary shall be a combination of traditional functional skills with technology-based tools competencies as enumerated above:

1. Science, technology, engineering and math (STEM) advanced literacy
2. Advanced communication and social media skills
3. Critical thinking skills
4. Innovation and growth hacking
5. Project management and supervisory skills
6. High-quality software engineering/programming skills in emerging technologies
7. Blockchain, big data, and artificial intelligence/machine learning know-how
8. Cloud, internet of things (IoT), and edge computing engineering capabilities
9. Entrepreneurial management
10. Cybersecurity
11. Laws and Regulations

The Philippines financial sector is gradually moving toward open banking, cloud outsourcing, use of quick response (QR) codes, and central bank-issued digital currencies. This was attributed to the Findexable report, in which the Philippines was considered a Watcher. This means that Philippines was one of the 10 countries which are "fast-growing FinTech destinations, and picked for their combination of local entrepreneurial success, regulatory foresight and the early signs of a growing local FinTech ecosystem". This demonstrates the Philippines' potential as a regional FinTech hub. Currently with over 200 FinTechs and growing, the Philippine FinTech ecosystem can grow further to produce successful technology enterprises that serve the country and Southeast Asia. In addition, the Philippine Central Bank or the Bangko Sentrali ng Pilipinas (BSP) [8] has also crafted regulations conducive to the development of the FinTech industry. All these have accelerated during the Covid-19 pandemic, which encouraged FinTech adoption in financial services and pushed the country as an up-and-coming FinTech hub in Asia. These regulations are:

a. the establishment of the National Retail Payment System (NRPS),
b. support for Virtual Currency Exchanges (VCE),
c. issuing soon-to-be-released regulations creating a new Digital Bank category, and
d. studying rules for an Open Banking regime

In order to keep abreast with neighboring countries and internationally, the FPA extended its research not only to Asian scenario but into the western countries. It was found out that

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[8] Diokno, B. E., (2020). Governor of Bangko Sentral ng Pilipinas (BSP, the central bank of the Philippines), Citibank's Perspectives Event, Manila, 16 September 2020. Accessed at https://www.bis.org/review/r201005b.htm, 17 October 2020.

the shift of customers practices and market needs in the Philippines was also observed in other countries. Hence, public and private universities are aligning its relevant academic program curricula to the emerging FinTech market demand and global economy. It was observed that the Massachusetts public universities are preparing their students for FinTech by recommending the following actions to be carried out by the states. These recommended actions are as follows:

1. expand coursework and related electives to include FinTech topics in machine learning, data analysis, and FinTech in traditional business/finance disciplines;
2. establish professional certification programs for individuals wishing to continue their education and adapt to the changing role of FinTech in finance and business;
3. create new tracks within established business and computer finance degree programs to integrate FinTech topics ad skills into students' educational experience;
4. plan opportunities for interdisciplinary experiences for business, computer science, engineering, and other degree candidates to develop a robust set of skills needed for FinTech-related jobs.

Another, universities in Southeast Asia are also aligning their relevant academic program to the needs of FinTech industry. The aligned program shall provide their students to acquire knowledge in the following topics/areas listed below and incorporate case studies in the FinTech related curriculum[9,10] . The program is delivered through the combination of video lectures, discussion boards, assignments, quizzes, and playbook.

1. FinTech innovation
2. money and payment, digital finance and alternative finance;
3. major technology trends including cryptocurrencies, smart contracts, blockchain, AI, and big data;
4. FinTech regulation and regulatory technologies: compliance ;
5. fundamental role of data and security in data-driven finance;
6. business and regulatory implications of technology for the financial industry;
7. how regulations and regulatory technologies are applied;
8. ways to analyze and evaluate what is driving technology innovation in finance;
9. how new technology impacts economies, markets, companies and individuals: risks and challenges.

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[9] MSc in Financial Technology, (2020). The Hongkong University of Science and Technology. Available at www.mscFinTech.ust.hk/program/curriculum on 27 October 2020.
[10] NUS Business School, (2020). FinTech: Innovation and Transformation in Financial Services. Available at https://programs.emeritus.org/nus-FinTech/index on October 27, 2020. National University of Singapore.

Further, it was recorded that designations of manpower that FinTech industry normally hired are "manager, developer, and engineer" [11]. This information provide insights to educators on curriculum development or enhancement, and reflections to learners on career development.

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[11] Sung A., Leong K., Sironi P., O'Reilly T., McMillan A., (2019). An exploratory study of the FinTech (Financial Technology) education and retraining in UK. *Joural of Work-Applied Management*. Emerald Publishing Limited.

4. THE LABOUR MARKET NEEDS OF THE FINANCIAL SERVICES INDUSTRY IN VIETNAM

4.1. The Vietnamese FinTech at a Glance

Vietnam (Vietnamese: Việt Nam, [vîət nāːm] (listen)), officially the Socialist Republic of Vietnam[9] (Vietnamese: Cộng hòa Xã hội chủ nghĩa Việt Nam), is a country in Southeast Asia and the easternmost country on the Indochinese Peninsula. The current population of Vietnam (or Viet Nam) is 97,717,109 as of Monday, December 7, 2020, based on Worldometer elaboration of the latest United Nations data (source https://www.worldometers.info/world-population/vietnam-population/).

Figure 10. Regions of Vietnam (https://en.wikipedia.org/wiki/Geography_of_Vietnam)

The interlinkage between financial services and information technology in developed countries appeared many years ago. Meanwhile this process has only occurred in emerging and developing countries since 2008 with the pursuit of financial inclusion and economic development of the Governments. In Vietnam, although there had been some FinTech companies in the field of payment services since 2005 (VTPay, OnePay, VTCPay), the evolution of FinTech has only been explosive with the wide penetration of the internet and mobile phone in recent years. It is widely accepted that the potential for FinTech industry

development in Vietnam is enormous. There are several reasons to explain this perspective. Firstly, the rate of financial inclusion in Vietnam is low. According to Solidiance, in 2017, only 59% of Vietnam's population has formal bank account compared to 86% in Thailand or 92% in Malaysia. However, this rate is expected to rise quickly and reach at 70% by 2020. Since Vietnam is one of the priority countries which World Bank is focusing its financial inclusion efforts through the Universal Financial Access. Additionally, the State Bank of Vietnam tries to reduce the cash-based transactions (currently cash is used in 90% of transactions). The State Bank of Vietnam furthermore hopes that the number of transactions by cash will have decreased being less than 10% by 2020. In other words, the fact that will boost the use of payment services of Vietnamese citizens in the future and in turns, facilitate the development of FinTech.

Nevertheless, there have been still some obstacles for the development of FinTech industry. The first is the lack of regulation and legal framework regarding services in this field. For instance, there is no regulatory clarity related to the cooperation between banks and FinTech firms. Some services are not official legalized such as P2P lending (only banks and credit institutions are permitted). Next, with high potential for development, FinTech industry will demand more funds and skilled workforce. However, FinTech companies lack of capital resources and there are few training programs in this field. Finally, the habit of using cash in making transactions of citizens might take time to change.

With the reference to the Financial Services Industry/FinTech context, Higher Education scenario in the topic of FinTech, key drivers of high growth rate of FinTech industry could be also the penetration of mobile (52% of population, 84% of mobile is smartphone) and internet (72% of population). This widespread of smartphone and internet usage, together with the young population will be the foundation for the development of FinTech industry in Vietnam. Finally, the economy of Vietnam has rapidly expanded in recent years. There is a considerable increase in the personal incomes as well as in consumer spending. All of this has spurred the investment in the field of FinTech industry. According to Vietnam FinTech Forum 2018, Vietnamese startups have poured $129m of investment into FinTech industry which drives the market value to $4.4b in 2017 and it is expected to reach at $7.8b in 2020.

There are many types of FinTech companies in Vietnam which could be categorized into 3 main segments. The first one is payment services which account for 89% market shares in 2017. A service in this segment includes mobile payment and payment platform. This type of service is estimated to grow at the rate of 12.5% until 2025. The second segment (9% of market share in 2017) is personal finance such as P2P lending, Group Lending and Artificial Intelligent Advisory. The last one is corporate finance (2% of market share in 2017) which contains P2P lending for business, crowdfunding/investing/lending or personal credit rating by social activities. The last two segments are expected to develop at high speed: 31.2% and 35.9% respectively until 2025.

Banking sector is connected directly with FinTech industry. Nowadays, many banks in Vietnam are cooperating with FinTech firms to develop their financial services such as mobile banking, internet banking or e-wallet such as MoMo. Some banks are investing in their own FinTech company or trying to acquire FinTech firms. It is forecasted that the wave of M&As between banks and FinTech firms will rapidly happen in the future. In this sense, the customers will have much more opportunities to experience the higher quality of financial services and FinTech in Vietnam will further develop.

Nevertheless, there have been still some obstacles for the development of FinTech industry. The first and most prominent barrier is the lack of regulation and legal framework regarding services in this field. For instance, there is no regulatory clarity related to the cooperation between banks and FinTech firms. Some services are not official legalized such as P2P lending (only banks and credit institutions are permitted). Next, with high potential for development, FinTech industry will demand more funds and skilled workforce. However, FinTech companies lack of capital resources and there are few training programs in this field. Finally, the habit of using cash in making transactions of citizens might take time to change. This may slow down the development's speed considerably. Fortunately, the Government is trying to solve gradually these barriers. On March 2017, State Bank of Vietnam created FinTech Steering Committee to build the regulations and legal framework regarding the activities of FinTech companies and banking sectors. Also, the Government promised to create FinTech ecosystem and support financial players as well as providing R&D, capital and expertise. FinTech hass just developed in Vietnam therefore, there are not too much of training programs in this field.

Despite notable traction and strides, Vietnam's Fintech sector remains nascent when compared to neighboring Singapore for example, and segments including data/credit/scoring management, and crowdfunding are still unrepresented.

The Vietnamese Fintech sector is largely comprised of players operating under a business-to-consumer model, making the underdeveloped business-to-business (B2B) market poised for growth.

At the same time, Vietnamese banks are accelerating their digital transformation, with a growing number of them adopting a partnership approach to enable rapid innovation. This provides B2B startups with plenty opportunities to support incumbents in their digital efforts [12].

The figure below (n. 11) shows the development of the Vietnam's Fintech scenario from 2017 to 2020 (Vietnam Fintech Report 2020).

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[12] 2020 Fintech Vietnam Report and Startup Map: Fintech Startups Tripled since 2017. https://fintechnews.sg/45354/vietnam/2020-fintech-vietnam-report-and-startup-map/
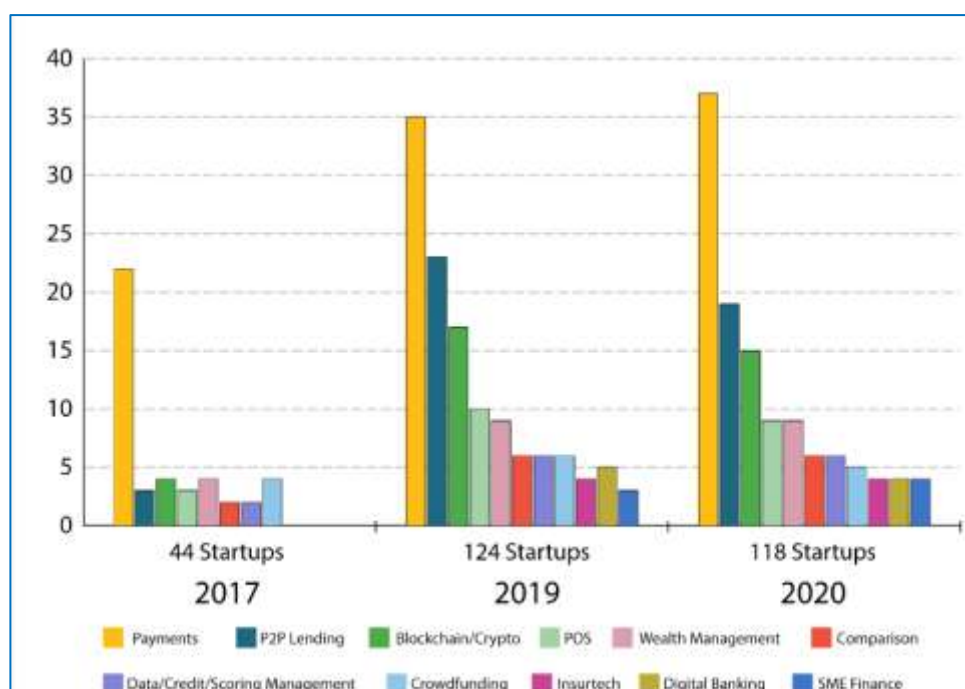
Figure 11. Vietnam's Fintech scene throughout the years, Vietnam Fintech Report 2020

4.2. The Vietnamese Higher Education scenario

One of Vietnam's strategies to achieve further economic growth is the modernization of its education system. The goals of several of the current education reforms were already laid down in a government directive from 2005 on the "Comprehensive Reform of Higher Education in Vietnam, 2006–2020". Among the bold reforms currently enacted are the establishment of new accreditation and quality assurance mechanisms, the creation of a national qualifications framework, and a drastic increase in higher education enrollments. Another goal of the current reforms is the internationalization of Vietnam's still somewhat insular higher education system. The government is trying to expand English-language education in Vietnam, and promote transnational cooperation and exchange with countries like Australia, France, the U.S., Japan, and Germany. Vietnam has also acceded to international education agreements, such as the Asia-Pacific Convention on the Recognition of Qualifications in Higher Education. Study abroad of Vietnamese students and scholars is explicitly promoted, while the government simultaneously seeks to increase the number of foreign students and researchers in Vietnam.

Many aspects of the education system are highly centralized and directed by the Ministry of Education and Training (MOET) in Hanoi. The MOET is responsible for most aspects of schooling and the implementation of education policy. The government has recently granted HEIs increased autonomy to determine their curricula and admissions quotas. In addition to

universities overseen by the MOET, a sizeable number of public institutions are under the purview of other government bodies, such as people's committees and different line ministries overseeing specialized institutions. Since 1998, large parts of vocational education and training are overseen by the Ministry of Labor, Invalids and Social Affairs (MOLISA).

In Vietnam, there is no finance and banking master programs or higher education programs offering subjects in FinTech yet. Some institutions and universities have cooperated with foreign universities offering master programs in finance and FinTech in which foreign universities will grant the degrees. One of these programs is Master of Science in Banking, Finance and Fintech of EM Normandie, France collaborated with Agence Universitaire Francophone, Vietnam National University, Hanoi.

The first and only full Fintech education program in Vietnam is the cooperation between School of Management, Asia University, in Taiwan and National Economics University, Vietnam to offer a Bachelor of Finance and Banking in Fintech in 2018. Asia University, one of the top universities in Taiwan, has a Fintech and Blockchain Research Center, which studies the latest developments in technology adoption in the financial sector. National Economics University is one of some universities in Vietnam that offers bachelor, master, and doctoral degrees in finance and banking.

Beside the official degree program, there are several training workshop, forum and contest organized to support the development of Fintech in Vietnam. For example, with the aim of spurring innovation in financial and banking services, promoting greater financial inclusion in Viet Nam, the Fintech Challenge Vietnam (FCV) contest has been organized during 6 months in 2018, with the participation of 141 Fintech companies (45 from Viet Nam and 96 from foreign countries), coming from 27 countries in 5 different continents. This reflects the enormous efforts of the State Bank of Vietnam Fintech Steering Committee and MBI/ADB in designing the program focusing on five core Fintech fields that are critical for financial inclusion, which are: (i) electronic Know Your Customer (e-KYC), (ii) Open Application Programming Interfaces (Open APIs), (iii) Peer-to-peer (P2P) Lending, (iv) e-Payments, and (v) Blockchain technology. Through the FCV, the SBV Fintech Steering Committee would be able to know more in-depth the technologies being applied widely in the fields of finance and banking; at the same time this is also the opportunity for Fintech companies to introduce their innovative ideas to administrators, as well as bankers and investors.

Another example is that the State Bank of Vietnam coordinated with the Asian Development Bank (ADB) and Australian Government to organize the Fintech Vietnam Forum 2018 with the theme of 'Fintech for Financial Inclusion'. The forum was also attended by over 300 participants representing the diplomatic missions, the international organizations, national and international experts, commercial banks, as well as Vietnamese and foreign Fintech companies. This forum was organized with a view to sharing new development trends in Fintech, breakthrough technologies that will be applied in the finance and banking systems

in the coming decade, and especially the state management measures applied to Fintech in some countries. This was also a great opportunity for representatives of Vietnamese management entities, banks and Fintech firms to gain more information and useful knowledge for their organizations.

Therefore, the demand for Fintech education and training in Vietnam is still very potential at this stage. The knowledge in Fintech will help students to adapt quickly to the changing labor market and catch up with the digital economy.

4.3. Survey Objectives

The objectives of this survey are to assessing the current situation and human resource needs in the financial technology sector (FINTECH) from enterprises' perspectives. Hence, it is vital to identify the general and specific capacities of training programs, which allow the universities to select the right strategy in choosing the content of the training program.

Vietnamese partners include 3 universities (University of Economics, Hue University (HCE); University of Economics, Hanoi National University (VNU-UEB) and Ho Chi Minh City Open University (HCMOU) conducted an in-depth interview with 14 representatives from FinTech enterprises; banks to analyze human resource needs and new skills in the financial technology sector according to the enterprises ' requirements.

4.4. Methods of sampling and survey

The WP1 includes a scoping study conducted in the Vietnamese universities aimed to assess professors and the universities' staff training needs on FinTech and digital innovation. This was carried out by University of Economics and Business of Vietnam National University (Hanoy), Hue College of Economics (Hue), Ho Chi Minh City Open University (Ho Chi Minh City).

Before conducting the survey, the interview script/survey tool was developed and completed through the following steps:

(1) The survey tool was developed with partners in the Philippines along with related European partners' comments.

(2) The interview script/survey tool was translated into Vietnamese then being edited by experts from the University of Economics, Vietnam National University (VNU-UEB) and Ho Chi Minh City Open University (HCMOU) to ensure the accuracy of terms.

(3) Conduct in-depth interviews with FinTech companies through direct interview (delivering questionnaires as well as exchanging via telephone).

This study used a combination of online and face to face survey methods. In terms of the

face to face survey, the researchers conducted direct interviews with the experts in FinTech-related field in Vietnam. Regarding the online survey, the researcher collected email addresses, phone numbers of experts, and emailed the questionnaires via links on Google Drive to respondents. If researchers have any inquiries they will phone to get more information. After the survey (July 15, 2020 - September 23, 2020), the team collected 14 in-depth interviews.

Respondents in the survey include experts from the FinTech related companies (Digital payment companies; bank; financial companies, etc.). These respondents are selected because they have employed FinTech-related human resources and will, therefore have lots of experience in assessing the training needs of FinTech in Vietnam.

4.5. Characteristics of surveyed enterprises

Among 14 surveyed enterprises, the areas of activities include bank, financial companies; online payment; mobile payment; e-commerce; electronic wallet; top-up/purchase card code/bill payment, financial technology services (FinTech).

N.	Name of Enterprise	Areas of activities
1	FiinGroup	Providing financial data, business information, industry research and other premium data-driven analytics services. Building, researching and exploiting financial database. Providing services on financial analysis and financial data.
2	Money Lover	Supporting personal financial management, offering solutions for customer's asset management
3	Finhay	Financial investment products and personal deposits, financial portfolio management
4	MB Digital Banking Division	MB's Digital Banking Division implements digital solutions for the financial services provided by the bank
5	VN Direct	Property management, financial management of stock companies for individual and institutional investment customers
6	CIMB – Individual customer Department	Digitalization of banking services for individual customers
7	NAPAS – National Payment Corporation of Vietnam	Financial switching company specializes in providing electronic payment and clearing solutions for electronic payment gateways for businesses
8	Sai Gon Thuong Tin Commercial Joint Stock Bank	Bank
9	KIS Securities Joint Stock Company	Stock
10	Sai Gon Joint Stock	Bank

	Commercial Bank	
11	Innovation Solution Pte Ltd.	FinTech
12	Joint Stock Commercial Bank for Foreign Trade of Vietnam, Hue branch	Bank
13	FPT Da nang	FinTech/Business development
14	VNPAY	Digital transaction; mobile banking

Table 1. List of surveyed enterprises in Vietnam

The findings indicated that most enterprises have specialized departments/ divisions performing research, development, and innovation (R&D) functions. Since these companies operate in the financial sector, the research, development and innovation of the product is very important. However, the allocation of budgets for R&D activities at the respondents' organizations is limited and unclear.

4.6. Results and FinTech Industry Labour Needs in Vietnam

According to experts, with a population of nearly 100 million people and a large number of young people, the demand for using financial technology-related services in Vietnam will increase rapidly in the near future. Currently, in Vietnam, there are many companies operating in the fields of financial technology, most of which focus on payment (accounting for nearly 60%).

Currently, 2/3 of the FinTech start-ups in Vietnam are providing consumers with online payment tools (such as Onepay, 123 Pay, Vina Pay, MoMo, ...); providing digital payment solutions such as POS / mPOS (such as iBox, Moca, ...); money transferring. In addition, the Vietnamese FinTech market has a number of start-ups operating in other areas such as crowdfunding (such as FundStart, FirstStep,…); online lending services (LoanVi, Trust Circle); managing personal financial data (such as Moneylover, Mobivi, Kiu); customer data management (such as Circle Bi, Trusting Social); digital banking (Timo). A representative from the company said:

«The COVID-19 pandemic is changing the shopping habits of Vietnamese consumers, many of whom are moving online ».

(Interviewee 14)

«Due to the impact of the Covid-19 pandemic and the strong development of e-commerce, the trend of cashless payment will develop rapidly in Vietnam. Therefore, the demand for human resources for financial technology will increase strongly in the next time».

(Interviewee 11)

In the banking sector, to improve the convenience of customers, the bank invests a lot of resources in the application of artificial intelligence (AI) and machine learning to meet online payment needs that are increasing rapidly among young people, so the banking industry has a great demand for FinTech human resources.

«The Bank will pioneer and apply many useful technologies to bring a better experience for customers and employees».

(Interviewee 8)

In the stock market, the application of FinTech is becoming more and more popular and supporting investors to access and support customers. Some FinTech applications have also appeared, such as online financial advisory tool TCWealth Advisor, smart savings and investment platform Finhay, FinBox securities investment advisory tool.

«The stock market has over 1,600 shares; without the support of technology, it will be difficult for security companies to take care of all their customers».

(Interviewee 9)

Despite the relatively small scale compared to traditional financial services, FinTech services are experiencing rapid growth in Vietnam. The evidence showed that FinTech has helped people and businesses maintain and even increase access to financial services.

«FinTech brings many benefits such as faster, more efficient transactions, lower costs, less requirement or no collateral for credit, etc. Digital financial services are therefore easy to reach low-income households, small and medium-sized enterprises (SMEs)».

(Interviewee 2)

Vietnam is implementing social distance measures to control the COVID-19 pandemic. Digital financial services have new opportunities to promote financial inclusion. In fact, FinTech plays an important role in reducing the impact of COVID-19 by facilitating timely and effectively implementation of financial solutions to beneficiaries, even those who do not have access to banking services.

In Vietnam, some institutions have cooperated with foreign universities offering master's programs in finance and FinTech, in which foreign universities will grant the degrees. One of these programs is Master of Science in Banking, Finance and FinTech of EM Normandie, France, collaborated with Vietnam National University, Hanoi. The full FinTech education program in Vietnam is the cooperation between the School of Management, Asia University, in Taiwan and National Economics University, Vietnam to offer a Bachelor of Finance and Banking in FinTech in 2018. Asia University, one of the top universities in Taiwan, has a

FinTech and Blockchain Research Center, which studies the latest developments in technology adoption in the financial sector.

«Although many universities in Vietnam have trained human resources in financial technology, compared with the explosion of demand in the market, there is still a large gap between the demand for human resources and training capacity ».

(Interviewee 13)

As can be found in the results, 14 respondents agreed that FinTech would develop more strongly in the coming time in Vietnam.

According to interviewees, the current issue about human resources for the FinTech industry in Vietnam is that people who know information technology (IT) often have no expertise in the financial sector. Conversely, people who know finance do not understand IT. Consequently, human resources who are good at IT without financial knowledge will not achieve effective results in FinTech application programming. In contrast, senior personnel with expertise in banking and finance often make slow or wrong decisions when investing in technology due to a lack of knowledge about IT.

"FinTech personnel must meet three requirements: financial understanding, IT skills and foreign languages. But the number of personnel who can meet all three requirements is very limited."

(Interviewee 6)

The results of in-depth interviews with experts showed that the necessary skills for the operations of FinTech companies and banks focus on the following groups:

1. Investment management skills;

2. Financial risk management;

3. Management skills in operating the company's activities; teamwork and online marketing;

4. Skills to create relationships with businesses;

5. Business data mining skills.

6. Good insight into technology (data processing);

7. Good technical and professional background in product development

8. Data analysis (Financial Computing with Python and R)

9. The new emerging technologies such as Blockchain, artificial intelligence and big data analytics

10. Communication skills, creative thinking

11. Teamwork skills

When asked about the essential skills of FinTech personnel that can help the company compete, grow and meet future needs, interviewed experts said that, besides the degrees received from universities, staff should have experience participating in practical projects:

«Academic is not as important as real projects or experience».

(Interviewee 1)

Many opinions remarked that due to the rapid development of technology, regularly updating the knowledge related to financial technology is essential for human resources at financial companies; banks… Therefore, enhancing knowledge through master's and short-term training programs is essential.

« It is necessary to regularly update knowledge about technology and finance through master's programs in financial technology; data analysis training ».

(Interviewee 6)

For the demand for technology tools in use at the company, the main technology tools used in the company include:

1. NET, Java và specific software of the banking system such as Core Banking, Internet Banking, Card systems

2. Trading software, management software, systems

3. Big Data, IoT, Cloud

4. Online payment software

When asked about the company's support for the master's program in financial technology, the interviewees said that if the financial technology master's program is offered, it helps the learner gain knowledge of finance, technology and innovation. The comments said that:

✓ It would be more interesting if the program had a clear project for staff to complete at the end of the course, not just academic knowledge.

✓ This is a very good project that staff are highly recommended to participate.

✓ The employees' working capacity and creative thinking will be improved.

✓ Learners will be able to convert better the financial data and larger database management.

✓ It would be great if there are training programs related to financial technology.

✓ Learners will be allowed to participate in the program and to develop their

creativity.

As related the expectation from the Master programme the respondents feedback on the employees skills and knowledge to be improve/ acquired are the following:

- ✓ Employees will obtain the knowledge of more applicable technology tools.

- ✓ Employees will be able to make a practical contribution to the company in the Digital field.

- ✓ Employees devote to a company for a long time.

- ✓ Employees will be able to process and manage databases related to listed companies, capital inflows, macro data, industry data, etc.

- ✓ Employees will be developed their creativity as well as be able to use the technology.

- ✓ Employees will be enhanced their technology skills, financial management and teamwork.

- ✓ Employees will be enriched the knowledge about financial and information technology and teamwork skills.

5. CONCLUSIONS AND SUGGESTIONS FOR THE MASTER IN FINTECH DESIGNING

The Philippines has a total of 2,392 HEIs and over 200 FinTech companies. Seventy three from HEIs and twenty four FinTech and related companies participated in the scoping study. It was recorded that the entry level skills required by the FinTech and related companies are communication and business/finance skills with knowledge in analytics, problem solving, selling, design thinking, information technology, business and operation, product and engineering. The hard core FinTech companies need Talents who are adaptable to technology with financial background. The technical competencies of the Talents which FinTech industry needs are management engineering, management information system, programming languages, database, infrastructure, server maintenance, mobile App development, UI, and UX design. According to FinTech industry, they prefer experiences than degree. Based on the internal survey of Philippine Association of FinTech, the skills which the industry need are: digital sales and marketing, basic computer or software troubleshooting, use of online tools and teleconference, data analysis and insights, managing cloud-based operations through SaaS, and utilizing logistics and e-commerce platforms. The technologies and/or technology-enabling trends are: cloud technology, process and service externalization, robotic process automation, advanced analytics, digital transformation, blockchain, smart contracts, artificial intelligence, and internet of things. The tools used are computer, AI, ICT, ERP, POS, and own banking/insurance system. The software that are commonly used are Java, C++, and SAP.

On the challenges that were recorded, the COVID-19 pandemic was recorded the most challenging concern in both the industry and HEIs. Uncertainty in the market was also recorded. Also, culture was mentioned but this shall be embraced as selling point. Another are the lack of digital readiness and innovation skill of the available human capital.

Given the abovementioned necessary skills that the FinTech industry needs, majority of the respondents from HEIs 50 HEIs wrote that they are not prepared to teach these tools/ technologies. Hence, it is not only a master degree program shall be developed but also specialized short term courses for faculty members who need retooling. In addition, existing FinTech relevant programs shall be reinforced with the financial technology-enabling trends courses. The program shall incorporate workshop/s, immersion related activities as teaching modality, and various FinTech courses including capstone course. The program could include the developed BEEHIVE MOOC on entrepreneurship. It is proposed that the capstone course shall compose of two courses, i.e., Capstone 1 and 2 with the following student outcomes:

1. Capstone Course 1
   a. Acquire the techno/entrepreneurial mind set;

    b.   Able to prepare business model;

    c.   Capability to deliver pitching activity

2.   Capstone Course 2

    a.   Students capable to implement start-up activity

    b.   Students acquire domestic trade industry (DTI) registration

Competency requirements by the industry are leaning towards technological capacity building of the existing manpower, the restructuring of the existing relevant academic programs and the retooling of the educators who are in the finance, business and information technology programs shall be carried out by all means. The courses and the tools for faculty members competency upgrading are as shown below. We can call these as the "Critical 12".

1. Advanced analytics
2. AI
3. Blockchain
4. Cloud technology
5. Digital transformation
6. ERP
7. Java
8. POS
9. Process and service externalization
10. Python
11. RPA
12. SaaS

The Philippines financial system is like a wholesale digital transformation and FinTech is an upswing industry sector, its job market and likewise the skills requirements. Therefore, the offering of the Master in Fintech and relevant/related short term course is currently critical.

Interview results in Vietnam showed that completing the FinTech ecosystem in Vietnam is to train high-quality human resources. One of the solutions to this problem is to develop a FinTech training program. Besides financial modules, the program should provide learners with an overview of FinTech development, helping learners understand the principles of modern finance as well as develop the essential skills.

In terms of technology the training program should focus on:

1. Big data
2. digital banking
3. payment gateway
4. data analysis
5. digital identity

In terms of technology management the training program should focus on:

1. technology analysis
2. information security
3. modernization of enterprise information technology
4. financial information systems
5. technology application management

In terms of FinTech products and services the training program should focus on training technology-based service development applications includes specialized training in FinTech analysis through credit model, Blockchain-based on data, FinTech applications in corporate finance, personal finance, payment, consumer finance, online lending, asset management, risk management etc.

6. LIST OF ANNEXES

6.1. Annex I – Interview guide – English

INTERVIEW GUIDE QUESTIONS

This interview is administered in the Philippines and Vietnam to determine the current and future manpower needs to support the financial services industry in the Philippines and Vietnam. This activity is part of the TRUST project co-funded by the European Union Erasmus Plus Programme. TRUST project is a consortium of four European institutions (i.e., two from Italy, one from the United Kingdom and one from Serbia), three from Vietnam and four in Philippines which aim to develop a master degree program on financial technology and digital innovation.

This interview will take about 15-20 minutes of your time. The information from this interview will provide vital information for institutional planning for the development of the academic program. Your participation is completely voluntary, and your responses will be held in strict confidentiality. TRUST project will help Vietnam and Philippines improve its capability and competency in providing human resources who are technologically competent to support financial services industry.

With the submission of the information, I authorize the processing of personal data for archiving purposes in the TRUST scientific research having regard to Article 156 of the Regulation 2016/679/EU of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC ("GDPR").

A] *General Knowledge: Company Background*

1. Can you describe your company to us in terms of core business, mission, vision, and values?
2. What are the services of your company offer? What makes your company different from others?
3. Who are your competitors and what is your position in the market with regards to the market share and potential future growth?
4. How many personnel currently do you have? And, what makes your personnel stay with your company?

   [Should there is time and participant is willing to answer more question/s.]
5. What do you expect would be the growth trend in the next 3 years?
6. Do you have a dedicated internal office covering research, development and innovation (RDI)?

7. How much of the total budget does the company allocate to RDI in terms of %?

B] *Personnel Competency and Challenges*

1. Based on the services your company offer, can you describe the minimum manpower entry level skills do you need to support the services you offer?
2. Can you describe the manpower skills do you need to advance your company from your competitors, and to support future needs?
3. Can you describe the types of academic degree/competencies and skills do your current personnel have?
4. What challenges does your company are currently encountering?
5. Can you describe the kind of academic degree/competencies and preparation your personnel shall have to address the current and future challenges?

C] *Technological Tools and Services*

1. What are the main technology tools used in the company? Why?
2. Do you have an internal software development team? Which language is the most used?
3. Can you make additional inputs into the list of financial technology tools which various higher educational institutions provide students with general knowledge on blockchain, python, probability and statistics, language processing, scorm, sandboxing?
4. What can you say about letting your personnel go to master program in financial technology and digital innovation? This master program will produce people who would have literacy in finance, technology, regulations, and innovation.
5. What do you expect from your employee/personnel after graduation from the program?

APPENDIX

A] Some Relevant Academic Course

Courses	
Introduction to Fintech	Operations Research
Fintech Ecosystem and Innovations	Time Series Analysis
Principles of Finance and Risk Management	Data Management and Business Intelligence
Algorithmic Trading and Robo-Advisors	Information Retrieval and Analysis
Blockchain Systems: Concepts and Principles	Applied Cryptography
Python Programming	Design and Innovation Thinking
Python for Data Analysis	Entrepreneurship Principles and Business Planning
Probability and Statistics	Project and Program Management
Data Mining	People Management
Advanced Natural Language Processing and Deep Learning	Negotiation Principles
Quantitative Methods in Finance	Marketing and Communication Effectiveness
Regulatory Technology	Venture Creation and Startup
Anti-Financial Crime and Compliance	Technical Solutions and Finance Applications
Financial and Risk Analytics	

B] Some Related Products and Services

Products and Services	
Digitalization and Data driven operations	Money Transfers
New Technology platform	Alternative Data and credit Services
Blockchain	Updated lending Platforms
APIs	Payment Provider and Remittances
Mobile Apps	Ease of Doing Business
eKYC	Online Insurance selling
Events and Partnerships	Data Privacy
Mobile wallet	Taxation and Incentives
Digital Banking Services	Cybersecurity
New Insurance Platform and Products	Open Banking
Payroll Services	Others

6.2. Annex II – Interview guide - Vietnamese

PHỎNG VẤN DỰ ÁN FINTECH

Nhằm xác định nhu cầu nhân lực hiện tại và tương lai, phỏng vấn này được thực hiện để hỗ trợ ngành dịch vụ tài chính ở Philippines và Việt Nam. Đây là một phần của dự án TRUST do Chương trình Erasmus+ của Liên minh Châu Âu đồng tài trợ. Dự án TRUST là sự liên kết của 4 tổ chức Châu Âu (2 ở Italy, 1 ở Vương quốc Anh và 1 ở Serbia), 3 ở Việt Nam và 4 ở Philippines.

Quý Anh/Chị chỉ mất tầm 15 – 20 phút để hoàn thành phiếu phỏng vấn này. Thông tin từ phỏng vấn có vai trò quan trọng đối với tổ chức giáo dục trong việc lập kế hoạch phát triển các chương trình đào tạo. Sự tham gia của Anh/Chị là hoàn toàn tự nguyện và các câu trả lời của Anh/Chị sẽ được giữ bí mật nghiêm ngặt. Dự án TRUST sẽ giúp Việt Nam và Philippines nâng cao năng lực và khả năng cung cấp nguồn nhân lực có năng lực công nghệ để hỗ trợ ngành dịch vụ tài chính.

Thông tin mà quý Anh/Chị cung cấp cho chúng tôi chỉ được dùng để xử lý dữ liệu cá nhân vì mục đích lưu trữ trong nghiên cứu khoa học của dự án TRUST theo Điều 156 của Quy định 2016/679/EU của Hội đồng và Nghị viện Châu Âu ngày 27 tháng 4 năm 2016.

Trân trọng cảm ơn sự hợp tác của quý Anh/Chị!

1.1. Anh/chị vui lòng mô tả công ty của mình về các mặt sau: hoạt động kinh doanh chính, sứ mệnh, tầm nhìn và các giá trị cốt lõi?

Your answer

1.2. Công ty Anh/chị đang cung cấp các loại dịch vụ nào? Công ty của Anh/chị có điều gì khác biệt so với những công ty khác?

Your answer

1.4. Công ty Anh/chị hiện có bao nhiêu nhân viên? Và, điều gì khiến cho nhân viên ở lại với công ty Anh/chị?

Your answer

1.5. Anh/chị mong điều gì sẽ là xu hướng phát triển trong 3 năm tiếp theo?

Your answer

1.6. Công ty Anh/chị có phòng nội bộ chuyên môn gồm nghiên cứu, phát triển và đổi mới (RDI) không?

Your answer

1.7. Công ty phân bổ bao nhiêu % ngân sách cho RDI?

Your answer

2.1. Dựa vào các dịch vụ mà công ty đang cung cấp, vui lòng mô tả nhân sự tối thiểu ở vị trí khởi điểm (có ít kỹ năng) mà Anh/chị cần để hỗ trợ các dịch vụ đó?

Your answer

2.3. Vui lòng mô tả các loại bằng cấp/ năng lực và kỹ năng mà nhân viên Anh/chị hiện có?

Your answer

2.4. Công ty Anh/chị hiện đang đối mặt với những thách thức nào?

Your answer

2.5. Vui lòng mô tả loại bằng cấp/ năng lực và sự trang bị về học thuật mà nhân viên của Anh/chị cần đạt được để giải quyết các thách thức hiện tại và tương lai

Your answer

3.1. Các công cụ công nghệ chính được sử dụng trong công ty là gì? Tại sao?

Your answer

3.2. Anh/chị có đội phát triển phần mềm nội bộ không? Ngôn ngữ nào được sử dụng nhiều nhất?

Your answer

3.3. Ngoài danh sách các phương tiện công nghệ tài chính mà nhiều trường đại học đã cung cấp cho sinh viên như kiến thức chung về Blockchain, Python, Xác suất và Thống kê, Xử lý ngôn ngữ, Scorm và Sandboxing, Anh/chị có thể thêm đầu vào nào vào danh sách đó?

Your answer

3.4. Anh/Chị có thể nhận xét điều gì khi cho phép nhân sự của mình tham gia chương trình Thạc sĩ Tài chính Công nghệ và Sáng tạo số? Chương trình thạc sĩ này sẽ giúp cho người học đạt được kiến thức về tài chính, công nghệ, điều lệ công ty và đổi mới sáng tạo.

Your answer

3.5. Anh/Chị mong đợi điều gì từ nhân sự của công ty sau khi họ tốt nghiệp chương trình này?

Your answer